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Original research article

Energy poverty in the COVID-19 era: Mapping global responses in light of momentum for the right to energy

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ABSTRACT

This article presents the results of the COVID Energy Map, a novel, global mapping exercise tracking emergency responses undertaken by governments, regulators, utilities and companies in the Global North and South to mitigate energy poverty by keeping energy affordable and available. The map constitutes a comprehensive open access evidence-based database, so far collating 380+ emergency measures, in 120+ countries. This paper particularly shows and discusses how the response has been developing until early 2021, highlighting various emerging longer-term concerns and strategies across Global North and South. The global COVID-19 response merits close attention in our view, as it reveals both the universal importance of household energy services access and important underlying existing narratives and policy-making questions about securing energy services access as a vital basic need, and even a 'basic right'. In fact, the paper additionally evaluates whether and how COVID-19 responses seem to fall in step with a nascent global trend of (legal) recognition of 'rights to energy' in international, regional and national policy, including for example in the EU, India, Philippines, and Colombia. We conclude that while the COVID-19 response clearly reflects broad recognition of the vital importance of affordable, continuous energy services access for basic human well-being and capabilities during the pandemic, a right to energy perspective could additionally lay bare or give shape to important concerns about some households' too minimal (insufficient) forms of modern energy access, questions of equity, and the role of the state and other actors. In terms of equity the article particularly raises issues with the manner in which support was made available only to some consumers (e.g. on-grid, off-grid, regulated, or non-regulated, post-paid or pre-paid), or only for specific fuels, and not others. In addition, the lack of attention to clean (renewable) (off-grid) energy services in COVID-19 responses is striking, and worrying, both in terms of immediate response, and green recovery from COVID-19. We argue that a right to (clean) energy perspective would help to reflect on, and inform, both shorter-term and longer-term responses to energy poverty and COVID-19, and should aid the realization of sufficiently equitable, robust, modern energy systems in line with universal UN Global Sustainable Development Goal 7. Specifically, it should also help to fulfil SDG7.1.'s promise of 'leaving no one behind'.

1. Introduction

Government imposed COVID-19 lock-downs, along with persisting quarantine, self-isolation, home-schooling and home-working requirements, confronted people all around the world with the vital day-to-day importance of adequate, safe home environments, and with this, access to essential household services like clean water, energy or the internet.

Indeed, even prior to COVID-19, it was well recognized that, universally, people need access to affordable, modern, reliable energy services to sustain socially and materially necessitated levels of health, hygiene, well-being, access to information, education, social inclusion, or for the preparation of food. Essential energy services typically include space heating or cooling, lighting, hot water boiling, cooking, refrigeration of perishables and medicines, as well as access to ICTs for study, work, socialising, entertainment, and receiving vital health information and health care [1–6]. In this sense, while scholars working on 'energy

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Nomenclature

EU	European Union
IEA	International Energy Agency
SDGs	Sustainable Development Goals
WHO	World Health Organisation
UN	United Nations
UNICEF	United Nations Children's Fund
kWh	kilowatt hour
LPG	Liquified Petroleum Gas
OAS	Organization of American States
PMUY	Pradhan Mantri Ujjwala Yojana (Prime Minister's Lighting Scheme)

access', 'energy poverty', 'energy vulnerabilities', 'energy insecurity', or 'energy capabilities', have long been highlighting problematic shortfalls in adequate affordable energy services access [1,6–9], with evidence from Europe [1,10], the US [2,11,12], Latin America [3,13], Asia [4,14] and Africa [5,15,16], the current COVID-19 crisis seems to render such shortfalls, and related questions of inequity, visible in an unprecedented way [2,12–14,16–19].

This article presents and analyses the findings of a unique, evidence-based global mapping exercise, called the COVID Energy Map, revealing a wide variety of emergency measures undertaken by governments, regulators, and public and private utilities to ensure the affordability and availability of energy supplies for households during the pandemic, and thereby mitigate energy poverty. While some initial and partial overviews and analysis of such measures have occurred previously, at global, regional and national scales [2,11,12,14,17], our database represents the most comprehensive, global, ongoing, evidence-based, collection of measures to date, undertaken since March 2020. The map is still live, meaning new and updated measures continue to be added. Until March 2021, the map included 380 + policy measures, in 120 + countries, across Global North and Global South.

This article introduces the map and its methodology (section 1), after which it presents the findings through a first macro-level analysis of results. This analysis emphasizes the types of measures implemented, in different parts of the world; the manner in which measures evolved during the first wave of measures in March–June 2020, and second waves from June–December 2020; and highlights several concerns and recommendations regarding the short-term and longer-term strategies that can be seen to unfold (section 2).

Subsequently, the article proceeds to consider whether and how this global COVID-19 response may also fit in with a wider nascent trend towards the (legal) recognition of 'rights to energy' currently seen in law, policy and practice [20–25] (section 3). Major international policy agendas have recently underscored the essential nature of energy services access for human development and basic capabilities, including on rights-based platforms. The United Nations (UN) Sustainable Development Goals (SDGs), for example, promotes in SDG 7.1. that 'universal access to affordable, modern, reliable energy services' must be realized for everyone, and that 'no one should be left behind'. The SDGs equally refer to the fact that their realization is and must be grounded in human rights, including human rights law [26]. In 2019, the European Union's (EU) 'Clean Energy for all Europeans' package equally affirmed that 'energy services are fundamental to safeguarding the well-being' of EU citizens: adequate warmth, cooling and lighting, and people's ability to power electric appliances are all essential to guarantee European citizens' decent standards of living and health, or to allow them to fulfil their potential and enhance social inclusion [27,20,21]. The new *EU Pillar of Social Rights* of 2017 articulates that all persons have 'the right to access essential services of good quality,' including access to energy, and that 'support for such services must be available for those in need'

[20,21]. Section 3 will show that the *EU Pillar of Social Rights* is by no means the only major law or policy instrument to recognize people's 'right to energy', and demonstrates the wider global momentum towards recognition of rights to energy in law and policy practice, whilst highlighting a number of key aspects, concepts and questions emerging from a right to energy perspective.

Section 4, finally, reflects on how the current global COVID-19 response falls in step with these global developments, and what could be learned from the global COVID response and a right to energy perspective for future energy poverty alleviation strategies.

2. Mapping world-wide responses to secure energy services in times of COVID-19

From March 2020, the authors have researched and collated a wide range of emergency measures via the COVID Energy Map, on an open access Google My Maps platform which can be accessed through www.covidenergymap.com (Fig. 1), and is still live. Although the map is extremely comprehensive, it should not be understood as a definitive global account of COVID-19 measures undertaken in the sphere of household energy, largely owing to the methodological justifications and limitations explained below. Specifically, the absence of measures in certain areas does not necessarily mean that no measures are in place: it may well be that measures could not be found (e.g. due to language constraints), that measures to assist and protect households already existed prior to COVID-19, or that measures did not fit our selection criteria.

Our methodology consisted of several research methods. First, most measures were identified through desktop analysis of relevant 'grey literature', news websites and legal sources announcing emergency measures targeting household energy directly. Such sources were collected through searches with the use of internet search engines, regularly carried out since March–April 2020, along with searches of official websites of governments or regulators. Searches were conducted in English, French, Spanish, Portuguese, German and Dutch, combining variations of search terms like 'COVID-19', 'energy', 'electricity', 'gas', 'kerosene', 'LPG', 'cooking fuel', 'solar', 'renewable', 'disconnection', 'reconnection', 'relief', 'bills', 'utilities', 'discounts', or 'tariffs'. We also reached out to contacts in various international networks, and made use of research assistants, to include or check searches based on other language skills, like Russian, Arabic, Chinese, and various Asian and Eastern European languages. To our understanding, most emergency measures taken until at least early 2021 were (also) published in English, Spanish or French language news outlets, depending on the region. Finally, over time we have cross-checked against emerging COVID-19 policy trackers and literature (e.g. by World Bank, IMF, KPMG, NARUC State Response, CEPAL COVID Response, [14,16,19,28]). All sources supporting the measures and analysis in this paper are included in the map. Due to the language constraints associated with global inventories of this nature, as well as the widely different levels of (in) formality with which measures are announced, including by public bodies or utilities, especially across the Global South, the original sources for laws or policies could not always be reported. In such cases, collections of credible public press announcements were used.

The following criteria guided and curtailed our research and the mapping, with our search and mapping methodology grounded in an interpretative and inductive methodological approach [29]. This means that during the research progress, research design and implementation had continual feedback on each other, leading for example to adjustments in search terms and categories for the map, and the inclusion of a new category for 'off-grid fuel supplies' over time.

First, in terms of *types of actors announcing measures*, our research has focused on measures by public authorities, regulators, and (major) public and private utilities/companies, as those actors with both the greatest responsibility for, and decision-making power in, the sphere of household energy access and affordability during COVID-19, as well as

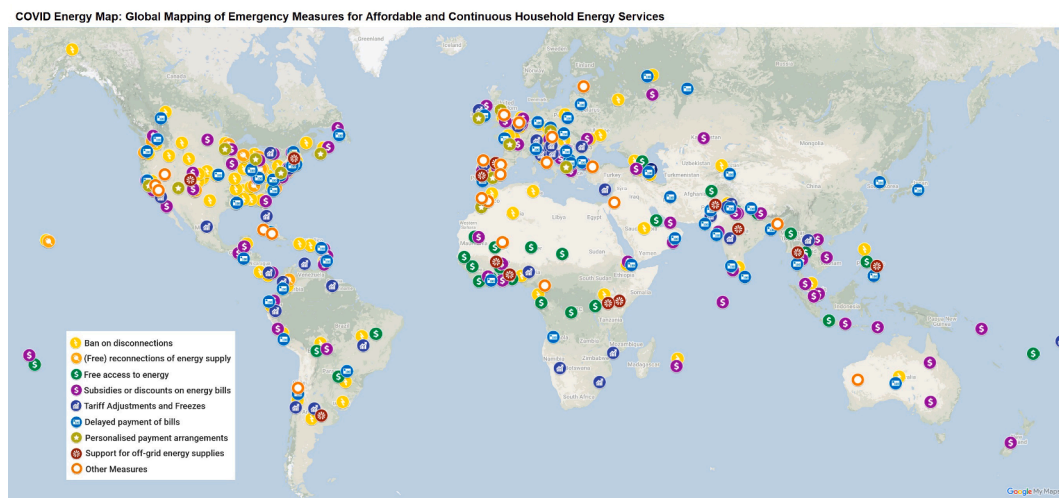


Fig. 1. Global map of COVID-19 household energy services relief measures.

the greatest ability to reach a large number of persons. We do not preclude that civil society organisations, religious organisations, international organizations, or community (mutual) support groups have also offered meaningful support to households in relation to energy consumption during the crisis. Yet, their activities are not included on the map, unless they partnered with one of the other actors.

The geographical scope of application of measures is largely national and regional/provincial, with an exception for some major metropolitan areas, because in some countries important decision-making power in relation to household energy can be vested in lower-level (municipal) actors, and metropolitan areas may represent a considerable proportion of a country's inhabitants or energy consumers (e.g. Delhi, Karachi, Brussels). We note that owing to the macro-level geographic scope of measures, certain important sub-territories or groups that could be in significant need of household energy assistance or protection during COVID-19 may be rendered invisible, such as indigenous territories or peoples, people in refugee camps, or those with nomadic lifestyles (e.g. herder populations, Roma people, or Bedouin peoples [30–34]).

The beneficiaries of measures are mainly households or 'residential consumers', although the map exceptionally includes some measures targeted to micro- or small businesses as well. This is important, since especially in the Global South there can be practical difficulty in distinguishing between business and home within some contexts [11].

In terms of types of support measures, measures must have been announced directly in response to the COVID-19 crisis, and specifically targeted to support households' energy consumption. This means that energy poverty alleviation policies existing prior to COVID-19, general welfare measures, or non-targeted COVID-19 support (e.g. income or housing support) that could equally benefit households' energy consumption were excluded, despite recognized benefits [35]. This may also explain why certain regions (e.g. Scandinavian countries) do not seem to have targeted COVID-19 measures for energy consumption, but we have not researched this correlation.

All in all, the initial scoping analysis quickly revealed that most measures could be grouped into the following categories, listed on the map: disconnection bans; (free) reconnection policies; discounts and subsidies on energy bills; tariff freezes and adjustments, delayed payment arrangements, and personalised payment plans. A category 'other measures' collates an assortment of measures not easily fitting into the other categories, or widely adopted, but nevertheless offering novel forms of emergency relief or serving a large number of households. Examples include retrofitting policies specifically adopted as part of COVID-19 emergency relief packages, VAT adjustments, emergency credit for pre-payment consumers, deferments on capital payments on low-income households' energy-efficiency loans, or deferments of debt

collection referrals or credit default listing. Not (yet) included on the map are retrofitting policies that are beginning to be announced as part of 'green recovery' from COVID-19, especially in the longer term. The category 'off-grid supplies' was highlighted separately to increase visibility of such support measures, even if largely involving discounts or tariff freezes as well.

Finally, the types of household energy supplies supported by the measures mostly include on-grid electricity and gas supplies, although we have found some limited evidence of support for off-grid energy too. These types of measures proved more difficult to find, likely due to the diversity of off-grid energy supplies used in different countries, and variations in (informal) purchase or supply modes and markets for such fuels, particularly in remote areas.

Two further cautions are in order before proceeding with the analysis. First, the categorizations of the measures cannot always easily be interpreted as 'hard and fast' categories: there is some blurring of measures, for example, because some measures may serve similar purposes (e.g. delayed payment arrangements and disconnection bans, or discounts, subsidies and tariff adjustments). Moreover, the same or different actors may have announced (multiple) different or similar forms of protection, in overlapping areas, with cumulative effects. Second, any comparison of measures across such a wide array of countries and continents must acknowledge the contextuality of measures. The introduction of policies (or lack of thereof) always takes place in a context-specific setting and must be interpreted in light of respective countries' history, politics, governance systems, existing (energy poverty) policies, and the nature and path dependency of energy systems.

3. Evidence of the Global response

3.1. First and second waves of measures

A first important finding from the mapping project is that most areas covered by the map saw measures rapidly being introduced during the first few months of the crisis, in March–April 2020. Often these measures had an initial duration of 2–4 months, or were tied to declared states of emergency and lock-down periods.

In some cases, public authorities however instantly recognized the possible long-term (financial) ramifications of the pandemic's onset, introducing considerably longer-term measures. In India, the government of the hardest-hit Maharashtra region, for example, immediately announced residential tariff cuts for a period of up to five years. The Namibian regulator put a price freeze on electricity supply throughout 2020–2021, while public authorities in Colombia and Panama

introduced bill deferral schemes with repayment periods of up to 36 months. In El Salvador, Chile, Paraguay, Peru, St. Vincent and the Grenadines, and the U.S. State of Connecticut, repayment periods up to 24 months were offered during the first months of the crisis.

In the US, especially, such long-term payment schemes can now also be seen as part of a second or third wave of measures protecting customers, especially as they replace or follow prolonged disconnection bans, many of which applied (and expired) throughout (late) 2020 or early 2021. Examples include Rhode Islands with repayment periods up to 36 months, Connecticut, Oregon, and Virginia up to 24 months, Washington up to 18 months, or North Carolina, California, Kansas, Maryland and Vermont up to 12 months.

In this sense, it can be observed that disconnection bans and deferred payment schemes actually seem to serve similar purposes, namely, preventing immediate disconnections of households in arrears. Indeed, the manner in which disconnection bans and deferred payment arrangements are distributed unevenly across different geographic areas on the map, or have followed each other over time in the same area, suggests they are not often implemented simultaneously.

In terms of the geographic distribution of different measures, it is also visible that disconnection bans were particularly popular in the U.S. and in Europe: out of all 109 disconnection moratoria, 70 are fairly unevenly concentrated in these regions. They were variously (self-) imposed by national or lower-level regulators, governments, and public and private utilities, in centralized or decentralized manners. We have no clear explanation for this geographic concentration, but it is likely that especially European countries or US States with winter disconnection moratoriums in place were able to easily extend these policies to offer protection during the initial lock-down periods over April-June 2020.

A considerable number of initial disconnection policies were extended, several times, throughout 2020, and in some cases they even applied year-round due to COVID-19, and well into 2021 (e.g. see Argentina, Ontario, Brussels, and Illinois, Connecticut, New York, New Jersey, Hawaii, Maine, Rhodes Island, Minnesota, Pennsylvania, Ohio, Wisconsin in the US). In France, disconnection bans ultimately remained in place until end of May 2021 through concerted efforts of the government and supplier EDF, based on extensions of the regular 'winter truce'. Supplier EDF implemented an additional COVID-related measure until 15 January 2021, by temporarily not carrying out power reductions that lower the amount of energy received by a household, as usually allowed during the 'winter truce'. In Spain, a general disconnection ban due to COVID-19 was extended twice for vulnerable households receiving the social bonus specifically, and applies currently until 9 August 2021.

The most popular protective measure to ensure affordability and availability of basic supplies across the Global North and South, and with the broadest geographic reach, are targeted financial relief measures. Both for on-grid and off-grid supplies, these have included 34 schemes for free energy supply; 74 schemes for partial discounts or subsidies on energy bills; and 40 direct tariff adjustments or freezes. Aside from direct tariff regulation, discounts and free energy supplies were provided in different manners, including through one-time or recurring transfers of credits (e.g. Timor-Leste), vouchers (e.g. Singapore), in-kind fuel supplies (e.g. India), (lump-sum) cash payments (e.g. Belgium, Laos), or (automatic) (monthly) energy bill deductions or provision of bill credits. In some countries, like Greece, Singapore and Belgium several different types of financial support measures have been implemented simultaneously, and for different groups.

Interestingly, the map shows that direct tariff regulation did not only occur in the Global South, but also in Southern-Europe and Central-Eastern Europe, where pro-poor tariff regulation is still more common despite liberalized market-oriented approaches generally supported by the European Union. Examples of European tariff interventions include governments and regulators in Spain, Portugal, Italy and Romania introducing price caps or reductions for electricity, natural gas or

butane, or private utility GEN-I in Slovenia and Croatia reducing its prices by 15% for 3–4 months between March-June 2020.

The duration of the financial relief measures varies widely, even if most were announced immediately at the start of the pandemic and extended at least once over time. Examples of generous extensions include those until August-October 2020 in the Cook Islands, New Zealand, Antigua and Barbuda, Mexico, and Greece, or until end of December 2020 in Bahrain, Ghana, Myanmar and Fiji. Thailand, Indonesia, Panama and Malaysia are frontrunners in having offered, by the start of 2021, generous free and discounted energy schemes for large groups of consumers, until at least March-June 2021. St Lucia and Bulgaria equally had financial relief schemes in place until at least March 2021, but introduced these programmes later on, in October and November 2020 respectively. The late introduction of relief programmes can also be seen elsewhere, like in the UK or Netherlands. In England, public authorities announced a £170 million COVID Winter Grant Scheme by the end of 2020 to assist with costs of food, sewerage and energy (heating, cooking, lighting), while the Dutch government announced a similar scheme in January 2021 for essential household expenditure for January-June 2021. This shows recognition of the prolonged and accumulating financial impacts of COVID-19 for households.

A similar trend is visible in the US, where several US states are adjusting their COVID-19 support strategies since summer 2020 to include financial assistance. This is done especially in recognition of the fact that disconnection bans and deferred payment arrangements did not affect people's actual payment burdens. This may lead to problematic debts, and large scale disconnections upon expiry of bans, or other hardship. States such as California, District of Colombia, Washington, Vermont, Kentucky, Georgia, Virginia, Colorado, Minnesota, and Michigan therefore started to implement COVID-19 hardship, bill relief and waiver programmes – often in addition to existing Low Income High Energy Costs Assistance Programmes (LIHEAP) [11,12]. These additional schemes are funded at least partially through special budget lines of the Federal CARES Act, the \$2.2 trillion federal COVID economic stimulus bill signed in March 2020, along with local public funds, and in some cases debt waivers by utilities. Examples can be found in New Mexico, Iowa, Kentucky, or in Michigan, where utilities waived 25%, or \$4.94 million of outstanding bills. In Washington, the State legislature decided to explicitly oblige utilities to establish COVID-19 bill relief funds, worth 1% of their annual retail revenues.

Finally, it is striking that although prolonged financial assistance schemes exist in the US, and across the Global South, it seems that most financial relief schemes in Europe and Africa offered much shorter-term support, in the range of 2–4 months, until June 2020. Exceptions in Africa include Senegal offering free electricity for six months to those in the social consumption bracket of < 250 kWh, until September 2020; Ghana extending its 100% discount programme from March 2020 until December 2020; or Mauritius offering 10–20% discounts until December 2020. In Europe, Greece and Spain extended financial relief programmes until September 2020, and August 2021 respectively.

3.2. Support for on-grid, off-grid and pre-payment consumers

As aforementioned, while the COVID Energy Map especially includes measures for on-grid electricity and natural gas consumers, some policies expressly target off-grid supplies too, both in Global North and South. For example, Spain, Portugal and Argentina imposed price freezes on bottled gas, while the Philippines froze prices for firewood, charcoal, kerosene and LPG. The English COVID Winter Grant Scheme covers all fuels used for domestic heating, cooking and lighting, including oil and portable gas cylinders. The Thai and Pakistani governments introduced discounts on LPG, diesel, kerosene and petrol, while India offered free refills of LPG to vulnerable customers enrolled in its existing PMUY scheme for cleaner energy consumption.

In terms of clean energy, some measures targeted renewable energy too: private off-grid supply companies Soleva and BBOX in Togo

supported their own consumers with 1-month free electricity credits [36], while in Burkina Faso, the government reduced the cost of solar kits by 50% in the context of their existing Solar Home System project for vulnerable households [18]. It has been a concern and complaint that small off-grid renewable energy companies, and their household customers, may not be adequately supported during the pandemic, with governments focusing their attention on on-grid consumers [15,37]. This is further discussed below. In Kenya, the REACT Kenya Relief Fund funded by Sweden, exclusively provided emergency grants to private off-grid energy companies struggling to ensure basic energy services for rural customers [16,37].

The duration of measures varies, with the Philippines' tariff freezes on kerosene and LPG only lasting 15 days, supposedly to prevent immediate price gouging, and other fuels lasting 60 days. The Thai LPG discount scheme lasted 5 months, while India's free LPG refill scheme initially applied from April–June 2020, but was extended until September 2020 to allow more (women-headed) households to use up allotted refills. In Portugal, the price freeze on bottled propane and butane gas initially applied in April and May 2020, and was reinstated on 14 January 2021, in response to major insurgence of the virus.

The COVID-response to off-grid fuels reveals several interesting concerns and narratives around the need to support certain fuels over others, or, the challenges of including those who lack modern supplies so far. In India, the LPG refill scheme for example explicitly served both to secure access to modern cooking fuels for vulnerable households during the crisis, as well as to preserve important progress made on stimulating cleaner cooking over the past years through India's existing LPG discount scheme. The PMUY scheme has existed for several years to curb the use of dirty solid fuels by Indian households, like coal, wood, dung or kerosene, in favour of healthier fuels and cooking methods, like electricity or LPG, as supported by UN SDG 7.1. Due to COVID-19 confinement periods, people using solid fuels indoors may be additionally exposed to associated harmful household air pollution, which the World Health Organization (WHO) has estimated to contribute to around 4 million premature deaths per year in 2018 [37–40]. India's response therefore shows that COVID-19 might jeopardise important gains on SDG 7.1, and that greater attention to cleaner cooking and energy supplies is needed as part of a wider public health response.

In other countries across the Global South, the implementation of support measures for certain on-grid consumers only, to the exclusion of off-grid consumers, raised concerns about resulting discriminatory treatment and equity. The Guatemalan government for example paid a 'family bonus' (worth up to 2,250 quetzals) only to households consuming on-grid electricity up to 200 kWh per month, attracting criticism for omitting the 10% of Guatemalan consumers in areas without grid access. The government therefore established further criteria to also provide a similar amount to those using solid fuels, or renewable wind or solar energy. In Togo, the government similarly only sponsored the energy bills of on-grid vulnerable electricity consumers, for three months, prompting the private renewable off-grid companies Soleva and BBOX to step in to support their own customers. In Nigeria, the government has so far refused to subsidize (free) household energy supply during the pandemic, despite express calls from some parliamentary members and civil society to do so. It argues that those 80 million consumers connected to the grid cannot be privileged to the detriment of the >100 million not connected. The cost of free energy supplies was another reason to refuse it [41]. One of the most inclusive approaches was found in Burkina Faso, where the government provided free and 50% discounted electricity supplies to various vulnerable on-grid, low-amps, low-volume consumers, as well as offered 50% discounts on solar kits, and made support available to those on pre-payment systems, and to electricity cooperatives in villages.

3.3. Support for different categories of vulnerable consumers and minimum consumption levels

While pertinent distributive questions clearly arise from the examples in the previous section, our research also more broadly reveals that the various scopes of support and overall eligibility criteria vary widely across and within countries, even if support seems typically targeted at the most vulnerable persons and households. Free energy supplies, for example, are commonly offered only to the lowest categories of 'subsistence consumers', with exceptions in the Democratic Republic of Congo, Bahrain, Ghana, Liberia and Rwanda, where all inhabitants seem to have benefitted from free energy schemes or bill waivers during the pandemic.

Amounts of free energy awarded however differ significantly around the world, e.g. ranging from 50kWh of electricity in Mali, Ghana or the Philippines, to 200, 220 and 250 kWh in Georgia, Brazil and Senegal respectively, or even up to 500kWh in Paraguay. Similarly, very different levels of energy expenditure were eligible for 100% refunds, subsidies, or bill waivers by authorities, including up to XOF2,520 in Togo (US\$ 4,60), Bs 120 in Bolivia (US\$ 12) and Afs 1,000 in Afghanistan (US\$ 13). It is also striking that free energy supply schemes are present mostly in the Global South, and not necessarily in the wealthier or natural energy resource-rich countries. In fact, some countries offering free energy supplies have very high numbers of 'subsistence consumers' that would be eligible for free energy or discount programmes, at significant cost to governments. Thailand's free energy scheme reportedly covers 10 million households, while in Indonesia 24 million households were expected to benefit from free energy.

While the implementation of such expansive support schemes may seem laudable, it deserves reminding that in a substantial number of developing countries – including those implementing free energy schemes during COVID-19, like Mauritania or Côte d'Ivoire – large parts of the population still lack access to electricity altogether. In such cases, emergency support for household energy consumption may thus benefit only a small, already relatively privileged part of the population. UNICEF flagged early on in the pandemic that in countries like Mauritania, Côte d'Ivoire, Lesotho, Kiribati, Sudan, The Gambia or Guinea-Bissau <10% of households may have access to electricity, and that this severely limits options for remote learning via radio, TV or internet during the COVID pandemic [42]. In such situations, support schemes arguably raise difficult questions of equity, and whether or how (public) funds should be used to continue supply for some people, while others do not yet enjoy access at all. Policy trade-offs like this, favouring support to certain households, but not others, were discussed in the previous section, but may be extended to those on post-payment and pre-payment contracts. Various trade-offs and approaches in providing support to different consumers groups, including post- and pre-payment consumers, can be seen in policies implemented in the United Kingdom, Senegal, Niger, Côte d'Ivoire, Chad, Uganda and Burkina Faso, where also some dual support systems have been implemented.

A further lesson is that across Global North and Global South different criteria are used to determine eligibility for COVID-19 related emergency support, and that the scopes of assistance can vary widely. In the Global North, measures tend to be targeted to existing categories of 'vulnerable consumers', including people previously identified as 'energy poor' or 'energy vulnerable'. Such definitions typically variously rely on income levels, family size, employment status, health status, disability or other aspects that may render a person vulnerable to energy poverty. In such cases, COVID-19 related relief might also be offered in addition to *existing* energy poverty alleviation measures, or include newly vulnerable groups [43,19]. Among the examples are an additional 25–40% discount on energy bills mandated by the Spanish government for existing recipients of the 'social bonus', or the double 'Winter Energy Payment' made to existing eligible households in New Zealand between 1 May and 1 October 2020 [19]. In North Macedonia, existing social

protection beneficiaries were offered an additional energy allowance payment of 1000 denars (32,50 Euros in total), in April and May 2020. A support scheme for essential households costs in the Netherlands was already mentioned, but attracted much critique because its implementation at municipal level led to widely different eligibility criteria and amounts (i.e. between 1.000 and 6.000 euro's over six months).

In the Global South, on the other hand, eligible consumers are often identified through specific (minimum) consumption bands or energy expenditure levels – e.g. certain amounts of kWh, low voltage or ampere levels, or low energy bills. This is likely due to the existence of different supply contract types, like subsistence contracts, low-voltage contracts, or pre-payment contracts, and a general lack of household income registration as a result of lacking administration capacity and/or many people employed in informal sectors. In Indonesia, free energy is for example offered to the lowest 450 V-ampere category, while 50% discounted energy is available for those on 900 V-ampere meters. A focus on consumption or expenditure levels also allows for implementation of staggered relief schemes like in Malaysia, where discounts ranged from 50% to 2% over six consumption tiers between 0 and > 600kWh, or Bolivia, with discounts ranging from 100% to 20% over five expenditure tiers between 0 and > 1000Bs.

All of these examples raise vital questions about what are households' minimum consumption needs for decent living, both across and within countries, or their minimum support needs, as well as their (longer-term) vulnerability to energy services deprivation as a result of COVID-19.

3.4. Long-term perspectives: Targeted support, burden sharing and position of (for-profit) utilities

Evident from the above is that many actors have scrambled to put in place measures rapidly as the COVID-19 pandemic unfolded, while, moreover, a considerable amount of measures have been extended, followed up, added, and still are in place. In some areas, different actors (governments, utilities, regulators) took the lead in different phases, including in relation to sustaining the same type of protection, such as a moratorium on disconnections or offering bill relief, e.g. France, Ireland, Uruguay, Brussels, New Jersey, Washington, Michigan.

What is visible from responses is that in the longer-term not only consumers may struggle, but also government and utilities' budgets are stretched. Especially utilities have begun to resist protective measures, citing loss of revenues, mounting unrecouped debts, needs for cost recovery, and to call for lifting of disconnection bans, or tariff hikes. The Sub-Saharan African continent shows a stark mixed picture in this sense, with some governments, regulators and utilities continuing to implement tariff freezes and adjustments to protect vulnerable consumers, and others considering (major) tariff hikes, or denying rate reductions (e.g. Uganda, Zimbabwe). In the US, households have typically been explicitly warned that COVID-19 disconnection bans would not affect their longer-term payment obligations during or after the crisis. Therefore, US legislators, regulators and utilities are presently trying to devise appropriate recovery or 'exit' strategies that allow utilities to resume normal operations, whilst ensuring continued protection for the poorest and vulnerable. Besides suitably long-term repayment plans, measures increasingly include (additional) bill relief and debt waivers for those furthest behind on bills, or struggling the most (see also section 3.1). In the UK, regulator Ofgem announced on 22 June 2020 that energy companies would be soon be allowed to start their debt collection activities again, although aggressive practices would not be tolerated and strong support must remain available for vulnerable households [44]. On 19 October 2020, Ofgem mitigated this announcement by stating it would require suppliers to strengthen protection for consumers struggling to pay energy bills during the winter months of 2020, especially for those equipped with prepayment meters. As such, new licence rules will be imposed from December 15, 2020. A key point of discussion in the UK during 2021 has been the need for, and appropriateness of, temporarily

raising the price cap in place for certain consumers since 2019, to allow for recouping of lost revenues [45].

Even if downfalls in revenues could be a genuine concern for utilities' creditworthiness and bankruptcy, or their ability to continue to deliver or invest in better quality services in the long-run [46], there is equally a genuine need to balance profit-making, cost recovery, with the affordability of basic supplies for all consumers. Our research shows that globally, various strategies for dealing with the longer-term implications of COVID, including mounting unrecovered household debt, now are unfolding. In the US, this includes the aforementioned innovative approaches whereby utilities are legally required or encouraged to usurp some of their annual revenue margins to provide direct support to the most vulnerable households, especially upon expiry of disconnections bans, while in other countries, direct tariff regulation could play an important role. Similarly, our research shows that around the world utilities have voluntarily developed various laudable initiatives to assist (specific) consumers during the pandemic, e.g. by lowering their tariffs, waiving problematic debts, suspending disconnections, offering (personalized) late payment plans commensurate with people's real ability to pay, or providing various of forms of direct financial support. Such initiatives can be found in Oman, Australia, New Mexico, Michigan, Nova Scotia, Cook Islands, Fiji, Solomon Islands, Maldives, and in most countries across Europe. The following section will however raise several concerns with too *ad hoc* or unreliable support, especially through voluntary private sector initiative.

In our view, the COVID response, and the COVID recovery period, will not only present an important stepping stone for considering the longer-term importance and implications of (lacking) universal affordable access to essential energy services for all, but it shall also have to confront salient questions about equity and longer-term strategies needed to inclusively alleviate energy poverty. This includes questions of appropriate burden sharing amongst different actors for universal (minimum) access to modern energy services, as well as removing and addressing structural barriers for people's inability to access and afford the energy services they need for day-to-day life.

4. Momentum on right to energy in policy and practice

The global responses and challenges around COVID-19 over the past year merit close attention in our view, for they could help to interrogate existing narratives and policy-making around energy services access. In particular, it may strengthen a view of access to energy services as a vital 'essential public service' – as necessary for health, education, safety, comfort, inclusion or personal development – instead of a 'commercial activity' fulfilled through contracts with (profit-making) companies.

The remainder of this paper assesses whether and how a shifting perspective of household energy access as a vital public good or service, fits in with another clear wider trend visible around the world, which is the increased recognition of rights to energy in law and policies.

As aforementioned, the *EU Pillar of Social Rights* recently came to recognize the essential nature of energy services access in the form of a 'right to essential services, including energy'. It is however by no means the only document supporting a "(human) right to energy". The regional Organization of American States (OAS) similarly states that everyone has the 'right to have access to basic public services', in Article 16 of the OAS Charter, which includes energy (services). The UN Committee on Social, Economic and Cultural Rights and the European Social Rights Committee, each supervising the implementation of important international human rights treaties, both acknowledge that existing rights to 'adequate housing' or to 'physical and mental health' include requirements for having access to basic facilities for 'health, security, comfort and nutrition', including 'energy for cooking, heating and lighting', along with 'sanitation and washing facilities, means of food storage, refuse disposal and emergency services' [20,47,48]. Both access to electricity and clean cooking have been explicitly recognized as 'underlying social determinants' for the right to health, while electricity has

been tied to rights to education, access to information, and freedom of expression [20].

In international law, the UN's Women Rights Convention of 1979 is so far unique in recognizing an explicit legally binding 'right to electricity' for rural women. This right was never given much attention until recently, when the UN Women Rights Committee was compelled to provide a legal interpretation [20,24,48]. The Committee went beyond women's right to 'electricity' by stating that rural women have 'various energy needs' for cooking, heating, cooling, transportation and electric services that must be met. To secure women's right to energy, States must ensure their access to essential services and goods, including 'sustainable and renewable sources of energy'; extend 'on-grid services to rural areas'; and develop 'solar energy and other sustainable energy sources with low-cost technology' [20,49]. This clearly shows a preoccupation with access to 'clean' or 'renewable' energy supplies as well.

Nationally, a clear trend towards recognition of rights to energy is also visible, including as inspired by aforementioned international and regional legal developments [48]. In Greece, courts for example decided in the aftermath of the financial crisis, that electricity is a '*vital social commodity essential to modern human dignity*'. An austerity tax incorporated into people's energy bills to be paid at risk of disconnection, was found to violate Greek people's constitutional *rights to human dignity and human development* because an essential service was misused to force unrelated tax payments [20,50]. In India, courts decided that '*because no one, in the modern days can survive without electricity [...] the right to electricity is a right to life and liberty*' under the Constitution. They viewed electricity access as vital for information access and knowledge, and called electricity a determinative factor for 'education, health, economic disparity and consequently, inequality in the society' [51]. Fitting to the current COVID-19 crisis, one Indian court even observed that 'children without electricity supply cannot even imagine to compete with others, who have the supply'. As a result, it was decided that people in informal settlements must be allowed to apply for electricity supply contracts [51]. In the Philippines, instead, the Supreme Court twice struck down a pending electricity tariff increase because *electricity is not merely an 'economic good' or 'commodity', but instead, an 'economic right to a basic necessity of life'* [20].

Finally, the Colombian Supreme Court also decided several times that 'access to electricity' is constitutionally protected as a fundamental right in connection with people's constitutional rights to adequate housing, health, and life and personal integrity [20,52]. As a result, households with specific health conditions were entitled to reconnections of electricity supplies regardless of their (in)ability to pay. Other households with constitutionally protected vulnerable members, like women, children, the elderly, persons with disabilities, were entitled to basic minimum supplies of 103.8kWh per month, while the household and utility concluded a payment agreement 'commensurate with their situations of extreme poverty' [20,52,53].

In international human rights law, the idea of a right to certain 'minimum core levels' of essential services is an indispensable element of human rights protection: without the enjoyment of 'minimum essential levels' of rights, to be realized for everyone with priority, human rights protection is 'largely deprived of its *raison d'être*' [54]. So far, an international minimum core for energy has not been established, even though one UN human rights committee recently recommended Belgium ensure that 'a minimum supply of energy' is available to households, including when budget or prepaid meters are installed. This Committee also more generally raised concerns about the impact of energy costs on household budgets, practices of cutting off gas and electricity for non-payment of bills, and expanding funding for and coverage of social tariff schemes [48,55]. For more established international rights, such as the right to water, or right to health, legal minimum levels of protection have been previously established, especially as tied to guidelines from the World Health Organization (WHO) on essential medicines lists, or minimally necessary litres of water per day person, taking into account local and personal circumstances, like

geography, climate, or specific health conditions [53,56]. While general WHO guidance on necessary 'energy services' does not exist [57,26], the WHO has developed valuable guidelines on household air pollution from fuel combustion (e.g. recommending non-use of unprocessed coal or kerosene), as well as healthy minimal indoor thermal comfort levels [58,59]. The SDG 7 Global Tracking Framework (GTF), supported by various international organizations, including the International Energy Agency (IEA) and World Bank, might also usefully inform debates on a universal minimum core of energy services for wellbeing [26,6,48]. Especially the GTF supports a wide range of 'socially and materially necessitated' energy services for human development, like heating, cooling, lighting, cooking, refrigeration, TV, radio, printing and computing and different forms of food processing [26,6]. Similarly, the United Nations Development Programme's 'EnergyPlus' concept for energy and development, considers that a broad range of household, community and productive energy services are necessary for the realization of adequate human development opportunities and the development of human capabilities [60]. Importantly, most of this framework's emphasis on 'energy services', rather than on minimum levels of kWh hours or energy expenditure, signifies that meaningful energy access depends on households' ability to use and convert energy efficiently, with specific appliances. The IEA recently acknowledged this by calculating that households may need a load of 1250 kWh to power a minimum of four lightbulbs (for five hours per day), a refrigerator, a fan (operating 6 h per day), a mobile phone charger and a television (operating 4 h per day) if they used 'standard appliances', while the same could be possible with a load of 420 kWh with more 'efficient appliances' [61]. This puts some of the current COVID related support schemes based on kWh or expenditure in a perspective of energy transition and energy efficiency needs as well [62,63].

Finally, aside from recognizing a right to minimum supplies, the right to energy clearly would also raise issues of affordability, disconnections, and people's (in)ability to pay for minimum access. In international law, it has been affirmed on this point that if any action is undertaken to interfere with an individual's right to water, including possibly through disconnections for the non-payment of bills, service providers are obliged to take a person's *capacity to pay* into account. It is not allowed to make access to essential services conditional on a person's (in)ability to pay, and payments must be commensurate with people's economic situation; essential services must be provided without discrimination of people in poverty [20,56,64]. Moreover, payments for essential energy supplies may explicitly not risk jeopardizing people's residual income and capabilities to enjoy other human rights, like rights to food, water, housing, education, or health [57]. States therefore have an obligation to safeguard, either through direct support, or by regulating service providers, that energy is available and affordable to all, including especially for those in extreme poverty. Affordability could be ensured by adopting appropriate policies and regulations for pricing, promoting the use of low-cost technologies, as well as targeting support to vulnerable persons in society, especially in times of economic contraction [54]. Direct and indirect charges for basic services, including connection costs, must be designed 'in such a way as to make them affordable to all', if necessary through support measures, like social policies, or subsidies, or through free or low-cost supplies, or income supplements [20,56]. Clearly, a range of such policies were implemented during the COVID crisis, but it is vital to also understand how policies actually equitably serve the poorest [65].

Overall, a rights-based perspective would thus urge conversations and action on minimal universal protection standards for modern, affordable, continuous energy services access, in a non-discriminatory manner, and with a view to protecting human dignity and fulfilling wider human development capabilities. From a perspective of equity, it especially asks: who in society is lagging behind, who is especially vulnerable (to energy poverty), and who may need which types of additional (targeted) support to enjoy access on par with others? It is vital to acknowledge here that the final contours and content of a right

to energy, will and should not be shaped only by law and policy disciplines. In fact, works from philosophy, ethics, and political theory have also begun to develop conceptual ideas on what a 'right to energy' may entail, and which vital questions must be asked [66–69,22,25]. Such questions invariably include: what *are* people's universal or specific essential needs for energy services in their lives, i.e. what is universal energy services access for? What are the *essentially or minimally needed energy services* to live a life in dignity, or a life people have reason to value, i.e. what is necessary to realize basic primary and secondary human capabilities [7]? But also, what are (un)dignified human living circumstances, in terms of quality of life, as well as in terms of affordability, choice, and personal development opportunities? In addition, when people have a *right*, what are the *duties* of others in society to secure or contribute to the enjoyment of such rights? And how does the 'right to energy' translate into present and future energy governance systems, including as these need to adapt to needs for energy transition [70]?

Finally, the content and shape of a right to energy should not be driven by academic debates and theory alone. Debates on the right to energy must engage the lived experiences, concerns, and responses of those struggling with or aspiring better energy services access 'on the ground'. Several organized (grass-roots) movements across Global North and South by now have begun to call for energy system reforms and social justice based on a 'right to energy' platform. Interestingly, these global movements do not only call for *affordable, reliable, modern energy supplies*, or *minimum supplies*, or *disconnection bans*, but also for *democratic management of energy systems*, and for *access to clean energy*. In Europe, the 'Right to Energy Coalition', a network of major Unions, social and environmental organisations, for example lobbies for EU-level recognition of a 'right to clean and affordable energy'. This would include a ban on disconnections, a minimum amount of energy for all, renovation of energy-efficient housing, protection of the most vulnerable, a common definition of energy poverty in the EU, and public and democratic ownership of the energy system [71]. In the UK, an *Energy Bill of Rights* promoted by the Fuel Poverty Action Network calls for 'the right to affordable energy to meet basic needs', as well as 'the right to energy that does not harm us, the environment or the climate', or that threatens health, safety, water, air or local community environments [72]. On the Latin-American continent, on the other hand, workers movements from Brazil, Chile, Colombia, Mexico, Puerto Rico, Uruguay, Venezuela and Argentina gathered in 2013 to adopt the *Mar del Plata Declaration on the Right to Energy*, calling upon all people 'to fight for the right to energy, against the commodification of energy instituted by capitalism'. It demands worker's rights for employment, wages and working conditions, in conjunction with 'the demands of entire peoples' who fight for the environment and against pollution [73].

5. The COVID-19 response in light of the nascent recognition of the 'right to energy'

To what extent does the global COVID-19 response fall in step with the trend of recognizing rights to energy in law and practice, its related questions, or show momentum for further deliberation and recognition of such rights in the wake of the pandemic? A first element clearly resonating with the idea of a right to energy is the manner in which measures have not only sought to provide safeguards for *continuous, affordable supplies*, but also *minimum supplies for households*, including especially *vulnerable households*. An important question that arises from the foregoing, however, is whether some of the present very minimal forms of 'subsistence access' secured for households in some countries (e.g. < 50 kWh, <100kWh, <150kWh, <200kWh or < 250 kWh per household per month) would indeed be sufficient for households to realize (minimum) essential energy needs for basic living standards and basic capabilities, e.g. for health, well-being, communication, education, hygiene, social inclusion etc. Clearly, policies on minimum levels of energy deserve to be critically reviewed in this light, certainly in the

long-term. It is also reminded here, that the architects of the SDG 7 Tracking Framework pointed out that only giving some electric lights, or a cleaner cooking stove to the poor, will likely not really improve their living circumstances; instead, it may 'shine a light on poverty' without realizing genuine capabilities to escape poverty and actuate adequate living circumstances [74,60].

A right to energy perspective thus helps to actively query people's 'minimum essential levels' of energy services access, both as part of the COVID-19 response and thereafter. Moreover, from a perspective of *rights-based equity*, it would help to reveal *unequal levels of minimum access* (to be addressed with priority), along with more *progressive levels* of essential supplies that would still fall within the remit of human rights enjoyment. In assessing what would be universally necessitated levels of energy services access, definitions of universal essential energy services need to be devised in the national context, along with appropriate levels of affordability of such services. In light of equity and protection of vulnerable persons, it is equally important to take into account any specific household energy needs or vulnerabilities in terms of people's situation of poverty, employment status, health, age, household composition, etc. and to assess the types of energy sources that are available to households (e.g. on-grid, off-grid, gas, electricity, renewable) or the types of appliances they can use. In any case, the international human rights law framework is clear on the fact that universal access to essential services cannot be made contingent on (in)ability to pay for basic services: universal access to affordable, reliable, modern basic supplies must be guaranteed based on a principle of non-discrimination. It is not acceptable that some households would continue to enjoy (increasingly) higher levels of access, while others continue to have access to comparatively low, or even no access to modern energy services. Governments are obliged to take steps and mobilize resources to remedy this, and ensure minimum and progressive equal access for all [54,56,20]. Such access needs to take into account people's ability to consume energy efficiently, and thus may have to consider minimum energy efficiency requirements, e.g. through labels for homes or appliances, requirements on retrofitting, and support for other energy efficiency gains as appropriate.

A second aspect rendered visible through a 'right to energy' lens, concerns the *types of actors* taking protective action. Clearly, not only governments, but also regulators and public and private utilities have stepped up. While the self-imposition of protective measures by (private) utilities, like disconnection moratoria, discounts, waivers, or tariff reductions, are certainly welcome towards securing affordable, continuous access, the limitations of such private approaches must be acknowledged in two manners. First, from a perspective of 'equity', only those who were (able to enter) in a (private) contractual relationship with a specific supplier in the first place will be able to benefit from assistance offered by companies. Second, this benefit typically is also not granted as a legal, or even moral right or entitlement, but likely is bestowed out of *humanitarian benevolence, charity, privilege*, or even out of *commercial self-interest*. The benefit can be similarly revoked at the will of the company. A right to energy perspective would emphasise that even when essential services are privately provided, there is a universally protected right and entitlement for everyone; it brings in the responsibility of government and/or regulatory authorities to regulate and monitor the actual enjoyment of affordable and continuous basic services provision for everyone [20].

A right to energy perspective, and implementing it successfully, will therefore likely require a substantial transformation in the mindset of key (public and private) energy stakeholders, and in energy governance systems. Different sets of representations of energy access and energy poverty are to change if energy is to be tackled as an essential service. So far, energy access is instrumentalized in the Global South for other purposes than the services and the socio-economic development that energy can bring to communities, i.e. it may serve religious or political authorities' objectives or conflicts, or serve to appease or suppress certain segments of society [75,76, also see 10]. In the Global North,

energy is often understood through the market and profit lens, as a commodity, rather than as a basic service, even though if, as seen in the COVID response, there is considerable attention for customer protection too. Specifically, a right to energy would suggest a (much) strong(er) protective (regulatory) role for public authorities, energy regulators and other oversight bodies, as the guardians of rights and important universal public service objectives. Relevant rights and regulatory principles would include: universality of coverage, affordability of supplies, continuity of supplies, and quality of supply, as well as non-discrimination, equality, inclusiveness, public participation and accountability [20,24,52]. Importantly, meeting essential energy needs would no longer be seen as an economic for-profit activity, but as an enduring vital social need that is at all times regulated and protected under such principles, and closely tied to important human capabilities for health, well-being, education, hygiene, comfort, inclusion etc.

Again, the major involvement of public authorities, both governments and regulators, in the COVID-19 pandemic response, suggests that there may now be a momentum to address issues around public regulation and (democratic) control, and for instilling the idea of (rights to) universal basic energy access in energy systems. We would also argue that more sustained attention to regulation and public interventions is especially necessary in light of the prolonged economic, health and social challenges that the COVID-19 pandemic is expected to present for households in coming years.

This brings in view a third aspect of the COVID-19 response that could align with the trend towards recognition and protection of people's rights to energy, which is the need for medium-term to long-term visions, strategies and policy-making, and which have their roots in decision-making now. Clearly, the concept of a universal 'right to energy' suggests that people have important stakes in universal modern, affordable, reliable energy services access *at all times*, beyond COVID-19. This was already supported prior to the pandemic, by UN SDG 7, and civil society activism on energy poverty calling for rights to energy with specific forms of protection and greater public control over energy systems and resources. Similarly, greater attention to clean energy, and the benefits and drawbacks of energy transition for the realization of rights to energy may have to be considered in greater detail.

In particular, only applying short-term protection measures for households, like disconnection bans, or short-term payment extensions, without meaningful additional strategies to ensure continuous and truly affordable access to vital supplies for households impacted by the crisis, will lead to considerable risk of people sliding (further) into energy poverty [2,12,20,35,77,23].

Our map includes a number of good examples of unfolding longer-term perspectives and protective approaches, especially in the US, Latin-America and some Asian countries, responding to concerns for inclusive access to affordable essential supplies, along with needs for structural revenue, cost recovery, and creditworthiness of utilities responsible for delivering services. In some cases, structural issues with utilities' revenues might be a problem existing prior to COVID-19, and may also be exacerbated by corruption or poor regulatory oversight [20,46,76]. In this sense, civil society organizations' demands for both better control over public service delivery, and moves towards cleaner, renewable, off-grid energy, or more decentralized energy systems, may bring about important new opportunities – and also some challenges – for considering how energy services are delivered for all, in affordable, reliable manners.

Noticeable examples of longer-term reactions by governments and regulators in the context of the COVID Energy Map, at least include longer-term tariff reductions, discounts, and free energy schemes, as well as generous repayment options, including as applied in a combined manner. In resource-constrained settings, appropriate targeted measures might also help prevent the accumulation of disproportionate household energy debts amongst those most vulnerable, and all associated stress and hardship. From a human rights perspective, it would be especially important that universal access to essential services is designed in such a

manner as to be commensurate with people's immediate and longer-term financial situations, and without affecting their ability to enjoy other human rights. Where necessary, (targeted) support, including as necessary, free energy schemes to support access for the most indigent may have to be employed. At the same time, the sheer unaffordability of even the most basic forms of energy for the poorest globally, also brings to light wider structural barriers for universally affordable and available energy services access. A 'business case' for energy provision may be lacking, and people may equally have extremely limited capacity to engage in (loans or credit schemes for) greater energy efficiency, or self-generating their (off-grid) supplies. This means many people will continue to rely on other actors, including government, to guarantee their access to basic supplies. As a matter of principle, equity demands that burdens for access to essential supplies are shared appropriately, and with attention to universal equal access. This includes distributing burdens for services provision appropriately across consumer groups (including residential, commercial and industry), e.g. with tools like cross-subsidization, social tariffs, and life-line tariffs, taxation or other schemes – as currently also encouraged by the UN's Regulatory Indicators for Sustainable Development supporting implementation of SDG 7.1 – [46,20]. As shown through the map, as long as private, profit-seeking entities are involved in the delivery of essential services, they may have to be strictly regulated to contribute to the public's interest, including by curtailing or redirecting revenues to support universal access, or by taxing corporations or excessive wealth appropriately. A right to energy perspective, paying attention to both *rights* and *duties*, foregrounds the obligations of the State, or of society as a whole, to deliver upon rights universally, inclusively, based on equity and justice considerations.

Finally, we regrettably must observe that COVID-19 responses so far have not seemed to factor in off-grid /renewable energy supplies to any great extent, although some interesting examples exist, e.g. in Burkina Faso. The same counts for practices around cleaner cooking, which in line with SDG 7 objectives may involve access to renewable electric or solar cooking, or use of cleaner non-solid fuels and stoves, like natural gas or LPG (see discussion in India) [15]. International organisations are in fact beginning to draw lessons from the COVID-19 crisis by underlining that access to "affordable, reliable, modern, and sustainable energy" must be part both of the *immediate response* to COVID-19 (e.g. supporting hygienic, decent living standards or access to health care) as well as the *long-term systemic recovery* from it [40]. The concept of "green recovery" from COVID-19 in particular, may foreground more structural energy poverty alleviation measures that will take into account decarbonization needs, such as retrofitting schemes [63]. The IEA recently called for greater efficiency gains for low-income households in pursuit of 'sustainable recovery'. Especially, targeted measures will generate multiple long-lasting benefits for consumers' energy bills, energy poverty alleviation, improved health and comfort, and better 'resilience in the face of climate events and price shocks' [63]. The NextGenerationEU Recovery plan, including its Recovery and Resilience Facility, similarly explicitly emphasizes energy efficiency, just transition, fair distribution of wealth, and related funding instruments such as the Just Transition Fund and Renovation Wave [78]. At the same time, a March 2021 study from the Global Recovery Observatory and UNEP concluded that total spending announced on energy efficiency as part of COVID-19 recovery programmes in 2020 amounted to USD35.2 billion so far, of which USD30.6 billion had been devoted to green retrofitting programs in the UK, South Korea, Denmark, France, Germany and Spain specifically – as supported by EU funds [79]. This reveals an immense challenge of adequate resources mobilization and allocation for global 'green recovery', as well as needs for robust, global and inclusive policy-making on the 'energy transition', along with continued evaluation of whether 'green recovery' is pursued in a manner that is sufficiently inclusive, fair, or equitable, i.e. prioritizes the needs of those "furthest behind".

All in all, the experiences of the pandemic, bolstered by a clear trend

of recognition of rights to energy globally, will hopefully be able to spur on further necessary low-carbon investments in affordable, clean, efficient, equitable universal access to energy services. Importantly, a *right to (clean) energy* perspective especially, should hopefully advance more effective public and democratic governance and control over people's "energy futures", and empower people to step up to demand from actors that just, equitable, affordable and low-carbon access is ensured, universally.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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